[32 134 [654] appearance of nature is also named, and this therefore deserves special treatment within this work. The Soviet government has specially undertaken research on this phenomenon, which is typical of the largest part of Siberia and also for parts of the European north; the government has erected eight permanent research stations for this purpose, of which four are in the regions being discussed: namely, in Petrovsk (Transbaykal), Skovorodino on the railroad line north of the northern arc of the Amur, Bomnak in the trough depression of the upper Zeya, and in Anadyr'. In addition to B. Shostakovich, M. Sumgin especially has done great service in research on permafrost. Orientation on the extent of the permafrost is given in the attached sketch map, which is based on Russian sources. This map shows that the only areas completely free from frozen ground are the areas on both sides of and between the Zeya and Bureya rivers and perhaps the area east of the Bureya Mountain Range, including the entire Ussuri country and the Maritime Krai. Frozen earth is not found in the larger southern part of Kamchatka and on Sakhalin Island either.

In the areas which are dominated by permafrost, the ground thaws in the summertime only superficially in a layer whose thickness varies considerably with the locale, and under this layer lies the permafrost, i.e. a constantly frozen layer of earth, which likewise is of varying thickness. The upper layer which thaws in the summer, is called "active" (deiatel'nyi sloi) /52/ by the Russians, and only it is the bearer of organic life. In the majority of cases the pieces of earth in the permafrost area are so strongly cemented together by ice that the ground gives way only under the blows of a crowbar. However, this sign of linking together by ice must not be used as the sole means of determining whether the ground should be classed as eternally frozen; rather this classification depends above all on the temperature. Thick rock can also bear permafrost, although no external changes can be discovered on the rock.

In the winter the ground freezes from the surface down. In many cases, then, the winter freeze and the permafrost grow together into one unit, but in most cases there remains between the two an unfrozen horizon, whose water under special morphological conditions, especially at the foot of slopes, breaks through the upper frozen layer or is pressed out by the pressure from above of the frozen earth. This leads to formations of ice on top of the ice (Naled'), which, since the water flowing out freezes again and again, can often extend over a large area and can attain a thickness of more than one, indeed of two meters.

1 [i.e. permafrost -- Analyst]

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Sea--i.e., the regions on both sides of the Long Strait--generally offer the greatest difficulties for shipping. Ice formation sets in the end of September to the beginning of October, beginning first in the areas near the coast, where the salt content of the water is lowered by the rivers emptying into the ocean. From the coast the ice then grows out into the sea, forming an uninterrupted ice covering by the end of November to the beginning of December. This solid ice stretches in winter to approximately the line where the ocean becomes 25 meters deep, and, accordingly, the width of the ice fluctuates considerably depending on the depth conditions. At the new Siberian Islands the ice extends from the coast out into the sea beyond these islands and, being 350 kilometers and more wide, it attains here the greatest width in the Arctic. Approximately the beginning of April the first signs of the breaking up of the ice appear. In May and June there is an active formation of splits. As the season progresses the great ice fields become smaller and smaller and finally become ice floes, between which a ship can go. The farther to the east one goes the later the breaking up of the ice begins; in the Chukchi Sea it usually does not begin until July. The deeper parts of the North Polar Basin are covered with Arctic pack ice, which toward the end of winter has a thickness of 3 to 3.5 meters. In the course of the summer this sinks to 2 to 2.5 meters. Through tidal currents, surface currents, and the effects of the wind, strains and pressings occur, which lead to a pressing together and with this to the formation of pack ice, whose height in places can reach 10 meters and more. Since the water movement on the shelf as a rule is toward the east, while over the deeper water the movement is directed toward the west, holes in the ice often appear in the border zones, forming here large splits, which at times can be traveled through. These split zones, which are called "polynia" (= ice-free places) by the Russians, /202/ extend from west to east through the entire Arctic part of the sea. In the Chukchi Sea it often appears right on the coast. With a north wind these ice-free areas disappear completely. The Arctic pack ice then grows together with the solid ice of the shelf. If the wind changes suddenly, then the pack ice is driven toward the north, and the polynia arrises anew.

As the attached table shows,[1] ice conditions in the entire coastal area of the Soviet Far East vary greatly from year to year and even change a great deal within a single year. A well expanded network of meteorological observation stations, along with an ice information

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[1] [Ch cat. 116, pp. 231-232 -- Analyst]

132 service and help from ice-breakers, could very much expand the use-
.654 fulness of the parts of the sea threatened by ice. And here the Soviet government has accomplished excellent work worthy of recognition.

505 The center of all the coastal traffic is Vladivostok, from which all lines start. Sea traffic is most active in the most southerly part of the coast as far as Nikolayevsk on the Amur. However, the more northerly localities are also visited regularly several times a year. The longest line leads to the mouth of the Kolyma, whence a trip by one or even several steamers at the same time is undertaken every year. Of the 2,021,000 tons of goods turned over in the harbor of Vladivostok (1935), 864,000 tons came from coastal traffic.

The following figures on distances may explain transportation conditions:

Coastal Steamer Lines

Distances from Vladivostok

Sovyetskaya Gavan'	1,075 kilometers
Aleksandrovsk on Sakhalin	1,335 kilometers
Nikolayevsk on the Amur	1,575 kilometers
Okhotsk	3,210 kilometers
Petropavlovsk	2,785 kilometers
Anadyr'	4,640 kilometers
Mouth of the Kolyma	5,200 kilometers

(Next table on following pages)

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/205/ B. SPECIAL SECTION

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/207/ THE PROVINCES

General Division

133 As the general survey has already shown, the geographical conditions of even a large division of the entire region fall into 1

1 [Ct. cat. 133, p. 232 for continuation — Analyst]

133 covered with tundra. Thus from the sea the cape looks like a mighty island, which in its layout vividly recalls the rocks of Gibraltar. The northern and also the southern mountain chain consist predominantly of gneiss and granite. In the Anadyr' Mountain Range Mesozoic rocks are already drawn into the faulting, and south of this range Tertiary layers are also drawn in; thus from north to south one encounters more recent mountain formations.

As a consequence of the easier accessibility the coast of the Chukchi Peninsula is very well explored. Shelagskiy Cape on the eastern side of Chaun Bay is approximately 950 meters high. Further to the east the mountains, which are 600 to 800 meters high, fall back and make free a broad coastal plain with lakes and beach formations full of lagoons. These beach formations, however, are here and there interrupted by round humpy mountains, in which the basic stone /291/ projects from alluvial land plains. At Kolyuchin Bay the mountains again go right down to the sea. Cape Serdtse-Kamen' has heights of
•[654] from 600 to 900 meters. Eight polar stations have been erected on the coast of the Arctic Ocean on the Chukchi Peninsula to observe the climatic and especially the ice conditions for the benefit of shipping. These stations are distributed over the Chukchi Peninsula at almost equal intervals. All are equipped with radio stations and are supplied for the most part by airplane. The eastern and southern coast of the peninsula, where the mountain ridges often go down to the sea, is richly divided by various bays. From Anadyr' Bay, KerstaBay penetrates farthest into the land. On a side arm of Kresta Bay lies the highest elevation on the Chukchi Peninsula, the Matachingay. With its 2,800 meters it dominates the mountains surrounding it which are 600 to 800 meters high. At its foot andesite appears, and thus one can probably correctly assume the mountain to be a volcano formation.

137 The bulk of the Chukchi Peninsula is covered with tundra, which makes for a very varied picture according to the relief. Swampy depression tundra, interrupted on the courses of the rivers by pasture and birch underwood, appears only in the valleys and plains. Of greater value is the dry mountain tundra, which is covered with good reindeer moss. The mountain tundra traverses the flat ridges of the mountains and insure the existence of the great reindeer herds of the Chukchi. The higher mountain ranges and mountain peaks are completely without vegetation and are richly sprinkled with rock ruins. Growth of trees occurs very rarely. It is limited to individual, protected spots. Only in the valleys opening toward the south into the Anadyr' region do

into being. However, a significant part of the immigration has been also for the benefit of agriculture, which, according to all reports, has made extraordinary progress. Thus, Kamchatka, which earlier had to have the bulk of its food supplied from outside, already gets along in large part with its own production, and the goal of autarchy in terms of food will probably soon be reached.

In the southern part of the peninsula, which has a mild climate, the breeding of cattle has attained a great and continually growing significance. The climatic conditions here are approximately the same as those of Sweden. The number of cattle had already reached several thousand head by 1939. A series of livestock sovkhoz have taken over the job of supplying milk and meat to the localities engaged in the fishing industry. In the Kamchatka valley and in the environs of Petropavlovsk agriculture, too, has made a start. The area under cultivation increases from year to year. In sovkhoz and kolkhoz grain, potatoes, and vegetables are cultivated with success. Fruit /301/ trees were introduced, and today are already yielding their own apples. A series of agricultural experimental stations in the interior and also in the coastal regions are to prepare the further development of agriculture and the breeding of livestock.

Of greatest importance for the economy of Kamchatka is fishing and the catching of sea animals. In this respect Kamchatka is the most important area in the Far East, and it is especially prominent because of the appearance of highly valuable types of salmon. The west coast has the principal role in the catching of salmon and crabs. On the east coast the area around the mouth of the Kamchatka is a pronounced salmon region, while Petropavlovsk constitutes the center of the catching of sea animals. From passive, rapacious catching of fish in immovable, built-in traps--the so-called "fish dams," which blocked the river--a transition has been made to catching the fish in sweep nets and drag nets. Thus the fish are now not caught at the mouths of the rivers alone but also in the sea. The earlier, primitive covering of the mounds of caught fish with salt, a practice which was customary on the entire coast of the Far East and under which great quantities of fish spoiled, has given way to smoking of the fish and salting of the fish in vats and above all to processing in canning factories. Modern fishing steamers with processing equipment on board have contributed to making Kamchatka today the second fish-catching region in the Soviet Union, second only to the Caspian Sea. In the catching of crabs Kamchatka even is in first place in the

world. The crabs are extraordinarily large and attain lengths of half a meter and more. They are drawn up from the bottom of the sea in drag nets in which they get entangled. Worthy of mention in this connection are the floating crab canning factories, which are used on the west coast and which carry out on board all the work from catching to canning.

The capital of the peninsula is Petropavlovsk. The city lies on Avacha Bay, which freezes over only exceptionally. The bay is surrounded in a semi-circle by the panorama of high volcanos. The city's favorable natural harbor, which a short while ago got a shipyard with a dock for ships of up to 5,000 gross registered tons, gains more and more in importance since the ships of the Northern Sea Route spend the winter here before they start out on their trip to the north. This applies especially to ships which regularly travel to the Kolyma River in order to ensure supplies of heavy materials to the gold regions on the upper course of the Kolyma. Petropavlovsk is the center of the hunting of sea animals and of the industries connected with this. In addition, the city also has fish processing installations, a brickyard, saw mills, and a can factory, which is of especial importance since it supplies the necessary material to all the smaller fish processing localities. In the treeless delta of the Kamchatka River lies Ust'-Kamchatsk, the next most important locality on the peninsula. More than 2,000 workers /302/ work in the canning factories there in the summer. The locality, in addition, has a special importance as the gateway to the interior of the peninsula, which can be reached easily only through the Kamchatka valley, while the other approaches have to overcome difficult passes. In increasing measure also wood is floated down the Kamchatka River to the coast, where it is processed in and sent on from Ust'-Kamchatka. In the broad longitudinal valley of the Kamchatka there are a series of villages, among which Verkhne Kamchatsk and Mil'kovo should be mentioned. In this area removed from the coast, horses are kept, since supplying fish food for dogs causes difficulties. At the inner entrance to the cross valley, at the foot of the largest volcano cone, lies the village of Klyuchi, from which the volcano receives its name. Here the traffic lines from the interior merge and make the locality into a central trading place, especially for fur goods. In addition to Russians and Koryak, some Chinese and Koreans have also settled here. Klyuchi has a scientific observatory for the study and special observation of the Klyuchevskaya Sopka. Below the village the Kamchatka widens into a sea decorated with islands.

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